Coastal Observation Technology System (COTS)
Workshop Notes
June 25-26, 2002
NOAA Coastal Services Center, Charleston, SC

Summary

CSC hosted a workshop in Charleston, SC for the Coastal Observation Technology System (COTS) grants recipients. Guests included lead representatives from each COTS project, along with key IT and data management personnel. The participant list and workshop agenda are included at the end of this document. The COTS programs include:

- Alliance for Coastal Technologies (ACT), Dr. Ken Tenore, University of Maryland
- Center for Integrative Coastal Ocean Research (CI-CORE), Dr. Kenneth Coale and Dr. Richard Zimmerman, California State University, Moss Landing Marine Laboratory
- Carolinas Coastal Ocean Observing and Prediction System, (Caro-COOPS), Dr. Madilyn Fletcher, University of South Carolina
- Center for Integrated Marine Technologies (CIMT), Dr. Gary Griggs, University of California at Santa Cruz
- Center of Excellence in Coastal Ocean Observation and Analysis (COOA), Dr. Ann Bucklin, University of New Hampshire
- Coastal Ocean Research and Monitoring Program (CORMP), Dr. Marvin Moss, University of North Carolina at Wilmington
- Wave Current Surge Information System (WAVCIS), Dr. Greg Stone, Louisiana State University

Goals of Workshop

- Participants are knowledgeable about good data management practices including protocols, standards, and documentation

- Participants agree to establish guidelines for data management practices that facilitate and encourage data sharing and integration at a national level

Brief Results

Planning for group coordination and collaboration, specifically with regard to data management and data sharing, was the focus of the workshop. The participants reached consensus on the nature of the collaboration, agreeing to the concept of a federation of regional observing systems that will help lead by example, and contribute as appropriate to the national goals for coastal and ocean observing, monitoring, and prediction. Seamless interoperability of these regional observing systems will be an overarching theme as they develop. It will start with dedicated efforts to ensure rigorous data documentation, and ultimately lead to electronic access and distribution of applicable data products to various users. Efforts to reach these goals will be furthered by the sharing of not only data, but also the methods by which those data are collected, documented, processed, analyzed, and products created. The COTS group will reconvene in the fall of 2002 to assess progress and formulate additional plans for the future.

Next Steps

1. Complete data management matrix; document purpose
2. Post all materials on Web site
3. Determine the long term scope of the Web site
4. Draft a federation concept document – Fletcher lead
5. Agree to key actions for near term support for COTS projects
6. Agree on convention for data propriety: use NSF guidelines
7. Refine metadata training needs and provide training
8. Follow up on programming support for FGDC nodes
9. Provide primer on federal data documentation requirements

Detailed Workshop Notes

Day 1 – June 25, 2002

Metadata Discussion

Why would COTS grantees want to set up a Clearinghouse?

- Make data available to others; share it; let others know it is out there.

How much utility does metadata offer a user (not the collector)?

- Depends on the richness of the metadata.

The FGDC standard may actually be too low to offer much utility beyond satisfying the federal requirement.

- We may want to move beyond "everybody should write metadata" and talk about creating a higher standard than the FGDC (maybe within COTS) that will greatly increase the utility of the metadata for a user looking for data.

CAST-NET – can post metadata (fill out form online that will create FGDC compliant entries) and make it available for searching. Does not store the data, just the metadata.

Need more education/clarification regarding the definition of nodes, gateways, etc; how nodes actually work; how to get information from them; and their actual utility.

NCDDC Presentation

Key issues for data sub-committee:

- Standard interface for gateways
- Use XML for data transport
- Agree on QA/QC standards
- Ensure FGDC metadata
- Operational systems

Open Discussion

Analysis of COTS projects as possible pilots for Ocean.US/ISOOS:

- Need involvement from the bottom to find out if integration works.
- What is the sustainable funding potential for COTS projects?
- Should COTS projects adopt ISOOS standards, and wait for ISOOS or lead the way? When will ISOOS make some recommendations and establish some guidelines?

- Research vs. operational – sustainable vs. short-term? Are these ideas mutually exclusive?
- Should be a continuum from research to application and management. How does this fit within CSC/OAR/NOAA?
- Need to really look into what it might mean to be a pilot for ISOOS. Need more information from and about ISOOS plans.
- Consider COTS as a testbed of complete end-to-end technologies and approaches for observing systems. Should look at ISOOS as the umbrella for coastal observations.
- Focus on metadata and QA/QC real-time as a way of making some positive headway and leading, by example, a key area of concern for ISOOS. Also protocols and interchange standards.
- COTS should go ahead and make some choices instead of waiting on ISOOS to specify actions.
- Importance of a partnership between COTS and NOAA. COTS can provide service and products to NOAA clients.
- Figure out ways to improve the potential of COTS as a NOAA line item, rather than as recurring earmarks.
- The common language of data management may be the most visible way to show interoperability and make positive headway.
- CAST-NET helps address metadata needs: what about extended use?

Matrix

A data management matrix, initially developed by CSC, was introduced to the group for review and discussion. The matrix consists of key data management categories and the evidence of these in each COTS project proposal. The group assessed the matrix and agreed to use it to begin to plan for interoperability. It will need to be refined by each COTS partner following the workshop. Key steps include:

- Describe and agree to a clear purpose for use of the matrix.
  ➔ Will describe how users will manage and put data to use
- Discuss matrix headings and adjust.
  ➔ Refine the level of detail
- Examine areas of commonality, overlap, and gaps.
- Look for opportunities to share data, techniques, and knowledge.

Day 2 – June 26, 2002

Plenary

Topics covered:

- COTS Web hub
- COTS group interaction
- Programming support for FGDC nodes
- Metadata training
- Breakout for policy discussion
- Breakout for technical discussion

1. COTS Web Hub

What is the purpose, content, scope, relation to other "hubs", and who bears the responsibility?

- Information documentation
- COTS Web interface - Information clearinghouse for COTS group
- Host a listserver for communication
- Post progress bulletins
- Advertise products
- Share other project related results
- Analysis, searching, and visualization tools on Web hub – is this capability needed here, or just at member groups own Web sites
- Post the matrix here as it will be dynamic – partners can refer to it
- Portal idea - will this be a real portal, and what will be the relationship to other portals
- Want to create a seamless network

2. COTS Group Interaction

What is the process, targets of opportunity, and frequency?

- Should have semi-annual physical meetings – hosted by members or at neutral sites – suggestions: UNH and Monterey Bay
- CSC should provide leadership - necessary to keep momentum
- Need to develop a Federation timeline that is strategy and output driven - create deliverables and show progress

- Need to develop an appropriations strategy
- Need initial data and products by fall of 2002

3. Programming Support for FGDC Nodes

What is it, why is it needed, what is the demand?

- Provides education about FGDC standard to those not familiar – required to create compliant metadata and post to an FGDC node
- Allows COTS to be part of building the NSDI
- Do not have to create your own node, but is an option
- Could have each project with a node; one COTS node; use already existing FGDC node(s)
- There is an available FGDC node model
- The bottom line reason for establishing a node is sharing of data
- Once node is created it is part of a network of other FGDC nodes
- All nodes can be searched from the main FGDC Web site (http://www.fgdc.gov/)

4. Metadata Training

What is needed, is there a demand, who provides it, and where?

- There is demand from at least 5 of the COTS groups
- Need to remember that this should be an ongoing process – there will be new questions concerning real-time QA/QC - everyone will be learning
- Establishes a help network with continuing support – not just CSC, but other COTS members as well
- Would like to have training in the fall of 2002
- Want to train scientists and technical people
- Scientists need to be strongly involved in, if not leading, the writing of metadata
- Important to recognize differing skill levels and needs
- Train the trainer is probably best approach – difficult to get many PIs together at once; train some PIs and some technical people and they can go back and show what needs to be done

- CI-CORE will be having a meeting in mid-September which will include 5 of the institutions involved in their project – possibly 15-20 people; would be good training opportunity
- CSC would like to train here for logistics and cost reasons but is open to group needs
- Comment made that often training is better at the trainees' home site, sitting down using their own data, their own machines, etc.

5. Breakout for Policy Discussion

Topics covered:

- Convention for release of data (publishing)
- Federation agreement - meaning and timeline
- Support strategy for COTS projects long-term
- Implications of NOAA program report – mapping to mission areas
- PI meeting
- COTS and national observations policy – ISOOS and Ocean.US

a) Convention for release of data (publishing):

- Examine current NSF guidelines
- NSF guidelines give rights to PI for 2 years, after that no proprietary rights
- Can data still be put up on Web site as quickly and openly as possible? – NOAA preference
- Web sites could have disclaimers asking others not to use data without first contacting the PI
- Potential for formatting data so that it cannot be downloaded and used – offers protection and gets results out

b) Federation agreement - meaning and timeline:

"Commitment to agree to identify where we can help each other."

Benefits:

- Position COTS to lead in the observations world
- Present a unified front and message
- Interactions can lead to functional development
- Begins to create various levels of cooperation and partnership

➔ National
➔ Regional
➔ Inter-regional

Cons:
- Loss of autonomy for individual projects

Need to have a written federation document

- COTS singular mission statement, expressing how you represent yourself, as well as your COTS partners, on the Hill and to NOAA
- Should contain principles of commitment and purpose
- Target date of August 2002 for a Federation one-pager – lead is Madilyn Fletcher
- One-pager and eventual Federation document will provide specific COTS communication and terms of reference materials for others to learn what COTS is all about

c) Support strategy for COTS projects long-term:

- June 2002 thru…? – FY03 appropriations: immediate
- Nov 2002 thru April 2003 – FY05 NOAA planning: opportunity
- Feb 2003 – FY04 PresBud to the Hill: opportunity
- March 2003 thru Sept 2003 – FY04 appropriations: opportunity

d) Implications of NOAA program report - mapping to mission/theme areas:

Jeff and Gene assess report for links and opportunities for COTS

- How can the COTS federation help VADM Lautenbacher?
- How will working these recommendations improve COTS strategies?

e) PI meeting:

Open science meeting defined by purpose and tactical cooperation – it should be "community interest driven."

- Theme sessions
  - ➔ IT
  - ➔ Physical observations
  - ➔ Links to ISOOS
- Illustrative

f) COTS and national observations policy - ISOOS and Ocean.US:

COTS agreements:

- Proof of concept for data sharing and protocols
  - ➔ What are they?
- Testbeds for all kinds of data management issues
  - ➔ Link to CSC mission

COTS as part of national backbone:

Benefits –

- Optimum systems through integration
- User based systems and input - bottom up
- Sustainable funding

Concern –

- Adopting ISOOS protocols and standards

COTS as ISOOS pilots:

- Understand concerns that may exist with ISOOS standards and protocols
- Become a part of the dialogue so that the COTS federation can build appropriate relationships with the Data and Communications (DAC) subcommittee structure development
- Look at research vs. operational
- COTS participants talk to ISOOS organizers
- Pieces of the puzzle
  - ➔ Metadata, etc...
  - ➔ Best practices, standards

6. Breakout for Technical Discussion

Topics covered:

- Data management matrix
- Resource sharing

- Interoperation standards (NVODS, etc.)
- Metadata standards
- QA/QC
- Goals and timeline

a) Matrix:

These fields should be added or expanded or have more detail

- Add output formats
- Add geographic location - lat/lon and/or specific description
- Add data rate/volume
- Add users preferred product format
- Add QA/QC and calibration procedures for both instrumentation and data
- For the external data collected field, provide a full description of the data set and if it is not widely available annotate with a contact
- Data analysis field is concerned with methods
- Data formats field – include whether the format is open and importable, and also which application it is based on or designed to work with

Much of the matrix information will be captured in the actual metadata records. Detailing the information for the matrix will allow all to benefit from the best practices that are available.

There was brief discussion of a controlled vocabulary – essentially meaning that everyone is using the same terms. If needed, build a "meta-thesaurus" so that new or different terms could be grouped under headings that are familiar.

Return date of July 10, 2002 for completing the matrix to the degree possible. The goal in filling it in is to be as descriptive as needed, the more detailed the better. It will be a dynamic tool, changeable whenever it needs to change.

b) Resource sharing:

What should be shared?

- Programming code
- Measurement and monitoring techniques
- Expertise

How to share?

- Use the matrix
- Listserver – to be set up on CSC web site
- Need to make sure code is open source
- Need to educate others at the institutions involved that sharing is a good idea - there may be resistance from others involved who are not at this workshop
- Sharing of interfaces – how designed, code behind them
- Use Cast-Net metadata collector as a common tool
- All agreed to prepare a summary of tools, code, etc., that is ready to be shared at this time – make this available through the COTS web page @ CSC as soon as possible

c) Interoperation standards:

NVODS

- Transport protocol
- Provides means to access and pull back data

FGDC

- This should be the lowest common standard for this group
- Moving beyond the FGDC standard will make metadata searching tools more effective
- Extend the standards for the COTS group
- Can use free text fields within the FGDC model
- Baruch group will attempt to put together a template for an extended metadata standard for coastal observations - target date for template is July 30, 2002
- Possibly develop a new metadata profile for coastal observations data

d) QA/QC:

- Main point is to document how it is done

- The methods are usually site specific and/or project specific
- Includes quality of not only the data, but also the instruments, sensors, etc. used to collect the data

e) Goals and timeline:

Want to achieve a seamless integration of data and display

- ASAP - identify tools, code, etc., ready to be shared and make them known to other COTS participants
- July 10, 2002 - complete and return matrix to CSC
- July 30, 2002 - complete template for coastal observations metadata
- August 15, 2002 - Baruch/UNH identify and communicate data and interoperation potential
- January 1, 2003 (possible) - Baruch/UNH collaboration for a demonstration of interoperability

Participant List

External

Troy Alphin, University of North Carolina at Wilmington
Bill Armstrong, University of New Hampshire
Fred Bingham, University of North Carolina at Wilmington
Ann Bucklin, University of New Hampshire
Jeremy Cothran, University of South Carolina
Hoke Currie, University of South Carolina
Margaret Dekshenieks, University of California, Santa Cruz
Dean Dunn, NOAA National Coastal Data Development Center
Madilyn Fletcher, University of South Carolina
Rodney Fredericks, Louisiana State University
Catherine Marzin, NOAA National Oceanographic Data Center
Marvin Moss, University of North Carolina at Wilmington
Dwayne Porter, University of South Carolina
Dave Remsen, Marine Biological Laboratory, Woods Hole
Randy Shelley, University of South Carolina
Andy Shepard, University of North Carolina at Wilmington
Nori Shoji, NOAA National Ocean Service
Gene Smith, NOAA Office of Oceanic and Atmospheric Research

Greg Stone, Louisiana State University
Ken Tenore, University of Maryland
Xiongping Zhang, Louisiana State University
Richard Zimmerman, California State Univ., Moss Landing Marine Lab

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Anne Ball, NOAA CSC
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Jeff Payne, NOAA CSC
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John Ulmer, NOAA CSC

Agenda

COTS Data Management Workshop Agenda
NOAA Coastal Services Center, Charleston, SC
June 25-26, 2002

Tuesday, June 25

TIME	TASK	LEAD
8:00 AM	*Continental Breakfast*	
8:15 AM	*Welcome* • Introductions and Agenda	Payne
8:30 AM	*Review Goals of Workshop* • Participants are knowledgeable about good data management practices including protocols, standards, and documentation • Participants agree to establish guidelines for data management practices that facilitate and encourage data sharing and integration at a national level *Review National Framework* • OCEAN.US, ISOOS, NSDI, NOAA • Role, integration, and status of COTS projects • Future funding opportunities and challenges • Results, products, and benefits	Payne
9:00 AM	*COTS Presentations (20 minutes each with questions)** • Goals of the project • Data collection – types, frequency, etc • Data management and dissemination plan	University P.I.s and/or Technical Leads

	• Products • Special issues * Note: a 1-page summary should be prepared in advance by each grantee to facilitate this discussion	
10:00 AM	Break	
10:10 AM	*COTS Presentations Resumed*	P.I.s/Technical
11:30 AM	*Matrix Introduction and Review*	Olmi
12:00 PM	Lunch	
12:45 PM	*Data Management Overview and Discussion* • FGDC Executive Order, Data Quality Act, NSDI • Data collection methods, standards, and protocols • Documentation of data – Metadata • Archiving and maintaining data • Methods for sharing	Ball
2:15 PM	*ISOOS Data and Communications Infrastructure*	Dunn
2:35 PM	Break	
2:50 PM	*Open Discussion* • Use of matrix • What is already in place? • What are the commonalities? • Can we model a few data management scenarios? • What problems are identified? What solutions? • How can COTS projects interact and communicate? • How can COTS projects support national framework?	All
4:45 PM	*Brief discussion of Day 2 approach*	
5:00 PM	Adjourn Day 1	

Wednesday, June 26

TIME	TASK	LEAD
8:00 AM	*Continental Breakfast*	
8:15 AM	*Recap Previous Day* • Review highlights • Discuss structure of remaining time • Comments and suggestions	Payne/All
8:45 AM	*Potential Discussion and Work Topics* • Continued discussion from Day 1 if necessary • COTS Web hub • NOS Portal • COTS group regular interaction • Partnerships at multiple levels • COTS projects as ISOOS pilots • Metadata training • Programming support for FGDC nodes	All

	• Policy breakout session • Technical breakout session	
10:15 AM	Break	
10:30 AM	*Discussion and Breakouts Resumed*	All
11:15 AM	*Review Agreements and Develop Next Steps*	Payne
12:00 PM	Adjourn Workshop	